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tive determination of gluten in flour. Making of special dishes as occasion requires, as pastry for Thanksgiving and Christmas candies.

Number.—(1) Correlated: problems connected with cooking, with science lessons and summary of weather records, with longitude and time, and with children's own expense accounts. (2) Outcome: use of denominate numbers, English and metric; common and decimal fractions.

Art.— Clay: sketching and modeling of scenes from the story of Marquette and La Salle. Painting: in connection with study of plant life and of the landscape; study of early American building.

Manual training.— Making of articles needed in schoolroom and necessary simple apparatus; designing and making of Christmas gifts.

SEVENTH GRADE OUTLINE.

ELSIE AMY WYGANT.

History.—The history studied in the seventh grade will be the development of book making. During October the class will study the making of primitive records, hieroglyphics in clay and stone, and wax tablets, dwelling more at length on manuscript books of the Middle Ages. They will try to picture phases of this time, showing how the monasteries became the center of learning, with the control of books and book making, and the life outside of the monastery in the feudal castle. The story of St. Benedict and his followers in the work of book making will be told, trying to catch that spirit of high purpose and devotion which inspired some of these copyists. The law of Charlemagne which provided that every monastery should have a scriptorium and at least one copyist will be noted. Story of St. Jerome and of St. Francis of Assisi.

The scarcity of books made teaching through pictures a common thing, hence the predominance of mural decoration in public places, churches, etc., at this time. As an example of this, Giotto's pictures of St. Francis of Assisi, painted on the walls of the church at Assisi, were chosen.

In November this work will continue, taking Venice as the center of art and of commerce, showing how the route of the crusades increased the importance of Venice.

December will be devoted to a study of the crusades and, in this connection, a rounding out of the pictures of chivalry begun in October.

This history will grow out of the actual making of books which is the industrial side emphasized in the seventh grade. The children will recover either an old book which they wish to preserve, or they may put into more permanent and serviceable covers some of the paper-bound books of Mosher & Co. These publications are chosen, both because of their suitable subjects and because of the excellence of material and beauty of workmanship. The children will bind their work of the year, and will illuminate and bind one other thing.

The group will form itself into a guild, with rules governing work, and their ideals of workmanship will be formulated. This will be written at the beginning of the year and modified as the children's knowledge of the work and interest in the craft increases.

A visit will be made to the Arts and Crafts Society of Chicago, and members of that body interested in book making will be asked to talk to the class in the hope that this contact with real industrial life may increase their respect for good workmanship.

Literature.—The literature will be used largely to enrich the picturing of the times, the people, and the places which figure in the history work. With this in view the children will read and have read to them *St. Jerome and his Beautiful Book*, by T. B. Aldrich; parts of *Ivanhoe* and *Marmion;* "Gareth and Lynette," from Tennyson's *Idylls of the King; The Vision of Sir Launfal;* Longfellow's "Venice;" "Giotto's Tower;" "The Sermon of St. Francis" and "The Builders." Some other work will be given in preparation for Thanksgiving, Christmas, and other festivals.

HISTORY REFERENCE.—Buchot, *The Books;* Putnam, *Books of the Middle Ages;* Matthews, *Book-Binding, Old and New;* Horne, *Book-Binding;* Pollard, *Early Illustrated Books;* Madan, *Books in Manuscript;* Montalembert, *Monks of the West*, Vol. I, p. 389; Longfellow, *Monte Cassino;* Jameson, *Legends of the Monastic Orders;* Arnold, *Little Flowers of St. Francis;* Sketch of "St. Francis of Assisi," *St. Nicholas*, Vol. VIII, p. 351; Quilter, *Giotto di Bondone;* Perkins, *Giotto;* Ruskin, *Giotto and His Works in Padua;* "Sketch of Giotto di Bondone," *St. Nicholas*, Vol. VIII, p. 676; "Guilds of Middle Ages," *The Craftsman*, December, 1901. (For full bibliography see ELEMENTARY SCHOOL TEACHER, March, 1902, p. 503.)

English.—The aim in the work in English is to make writing a pleasurable and easy means of expression, and to form and strengthen habits of correct speaking. Believing that ease in writing comes through writing often and regularly, at least one piece of work will be asked for every day during the coming term. This writing will cover the records of field trips, retelling or dramatization of stories which will be used for morning exercises and special festival programs, invitations to other grades, notes and letters to the parents, and written acceptance of invitations received.

Geography.—The geography for the autumn quarter will be a study of the region about Chicago, and will include field trips, each of which is to emphasize one or more topographical forms, namely, rivers, mountains, deserts, and glaciers.

Rivers (Calumet and Desplaines).

Mountains (Stony Island).

Deserts (Miller's Station and South Shore).

Glaciers (Stony Island and Desplaines River).

Every child supplied with a note-book will make hasty notes and sketches in the field. Upon our return the notes will be worked over, and a full record of the trip made. These records will be made in two ways. In some instances we shall simply give an account of the trip taken. In others we shall go with one or more hypotheses, and upon such a trip the notes will give only such data as proves or disapproves the hypothesis.

Every field trip will include, not only a study of the topography of the region, but of the plants associated with that topography.

For details of map making see the mathematics below:

REFERENCES: Salisbury and Alden, *Geography of Chicago and its Environs;* Shaler, *Beaches and Tide Marshes;* Tarr, *Physical Geography;* Russell, *Lakes of North America, Glaciers of North America;* Geikie, *Earth Sculpture;* Geikie, *The Great Ice Age;* Gulliver, *Shoreline Topography;* Cowles, *Ecological Relation of Vegetation of the Sand Dunes of Lake Michigan;* Cowles, *The Plant Societies of Chicago and Vicinity;* Merrill, *Rocks, Rock Weathering, and Soil,* Bulletin II, *Geological and Natural History Survey of the Chicago Academy of Science.*

Science.—A part of the science period will be given to working out the plant relations suggested in the field trips for geography. In this connection a study of the soil will be made and two problems proposed, namely: What does the soil contain that the plant wants, and does the difference in the amounts of water in swamp and sand areas account wholly for the modification in plant structures?

To answer the first question make an anyalysis of the soil to find the amount of water, organic and mineral matter in it. Make same analysis of plants growing in that soil and compare results.

To answer the second, compare amounts of water in equal amounts of swamp and sand soils. Compare amount of water in equal weights of swamp and sand plants. How do soils compare with each other? Plants with each other? The plant with the soil in which it grows? Make simple chemical analysis of the same materials and compare.

This analysis will be put into some graphic form for use in the museum.

Upon these trips the especial work of the plants at this season will be noted and a classified collection of the seeds made. If the children have a working knowledge of the means of seed distribution, the quantitive phase of the work will be done with two questions in mind. First, are some seeds more sure of getting planted than others? Second, is this the main factor in the abundance of a given species? (To answer this question data must be gathered next spring also.)

The animal life found upon these trips will be studied, and when practicable brought home and their preparation for the winter observed in an outdoor cage made for that purpose.

The weather record with its interpretation will be an important part of the science work. The temperature of the air and soil, the barometer, and the direction of the wind will be noted upon the October record. (Later other items, as amount and intensity of sunshine, amount of rainfall, etc., will be added.) The record is kept upon a chart so arranged that the temperature curve for the year may be followed. Change in landscape corresponding to the change in temperature and intensity of sunshine will be observed, and pictures of the landscape will be made twice a month to record this change.

The city weather bureau will be visited to see the methods of observations making in order to make our own as accurate as possible. The daily report of the weather bureau will be studied in view of the forecasts made upon it. As soon as a basis of judgment is gained, and some little skill in forecasting, the grade will form a weather bureau and make prognostications based upon their own observations and the weather report.

REFERENCES: Jackman, *Nature Study for the Grammar Grades; Practical Plant Physiology*, by Moor and by Detmer; Reynolds and Green, *Vegetable Physiology;* Coulter, *Plant Relations;* any good *Meteorology;* William Hamilton Gibson, *Sharp Eyes;* Cowles, *The Plant Societies of Chicago and Vicinity.*

Mathematics.— In the teaching of mathematics for the coming year the hope is that the children will grow into a sense of the need of the subject; that they may use mathematics as a tool, not as an isolated daily task. Because of this aim the problems in the various subjects will make conscious the demand for mathematics, so that at the time that a process is needed it will be taught, or drill will be given where skill in the manipulation of old processes is insufficient to make the tool a ready one.

Some algebra and geometry will be used during the year. The idea will be to emphasize the essential similarity rather than the occasional differences in the algebraic and arithmetical processes. When the use of fractions or the fundamental operations have become somewhat facile it will be the work of the seventh grade to formulate the principles involved. In cases where this is advantageous and feasible the processes may then be expressed in algebraic form. The positive and negative quantities, already somewhat familiar, will be used more freely, showing that every amount, magnitude, distance or force which admits of an opposite may be conveniently and simply distinguished by the use of plus and minus signs.

Geometry will be used whenever it will make the imaging clearer than will arithmetic and algebra.

Below is given, in some detail, such problems as may be demanded by the other subjects during the autumn quarter. It is not intended as a complete list, or that the whole will necessarily be covered. The amount and variety of the quantitive relations in the work are so great that only limitations of time and the children's ability can govern the choice of what is used.

The science work is very largely quantitive during this quarter. The children are more or less familiar with means of seed distribution, correspondence between lowering temperature and loss of plant and animal life, therefore the work will aim at definiteness of imaging. For instance:

a. Children will find actual number of seeds produced by a given plant. Number of these plants on a given area. What it would mean if every seed germinated. Number of years required for plants to seed specified areas. Percentage of seeds destroyed.

b. The temperature of soil and air curves plotted on monthly science chart, replotted on sufficiently small scale to show year's curve on convenient sized paper.

c. Weighing of soils by metric system and the percentage of organic and inorganic matters. Same with plants.

The mathematics will enrich the geography by the making of a topographic map of Stony Island. This will necessitate use of compass and level; construction and measurement of angles; computing areas of a rectangle and constant use of decimals and fractions. Sufficient drill will be given in use of the standards of measurement, acres, rods, and feet, to make the estimates of distance in the field work as accurate as may be.

Astronomy.—Variation of the sun's positions and movements—variation of heat and light, latitude, longitude and time at sea and upon land; lantern lectures showing motion and position of plants, lunar topography, nebular, star clusters, sun-spots, etc.

Home economics.—The analysis of the amount of water and of mineral and organic matter in the soil and in plants will be continued in the study of foods. Analysis will be made of potato, white of egg, milk, and wheat, and as certain elements are discovered in given foods, experiments will be made on the effect of heat upon this element.

This analysis, as well as the other, will be graphically represented in some form suitable for use in the museum.

Housekeeping.—Care of room and its decoration.

Art.—The study of book-binding predetermines that at least a part of he art work of the year shall be a study of design suitable for book covers and the illumination of books.

For geography and science, rapid chalk modeling, pictures of the landscape in color, and of plants, seeds, fruit, and animal life in pencil, color and clay will be needed.

EIGHTH GRADE.

KATHERINE M. STILWELL.

THE work of this grade for the autumn quarter will include history, geography, nature study, mathematics, gymnastics, music, manual training, and Latin or German. Detailed outlines of these subjects appear below. In their development reading, writing, drawing, painting, music, and modeling will be used.